NAVAL SEA SYSTEMS COMMAND

NAVSEA-00C4-PI-004

COMPRESSOR CAPACITY

TEST

SUBMITTED 00C43B

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REVISION: —

COMPRESSOR CAPACITY TEST

The following NAVSEA approved procedure provides the minimum requirements for conducting a compressor capacity test. Locally prescribed procedures may be used if they exceed the requirements of this procedure and are approved by NAVSEA OOC.

The Compressor Capacity Test should be performed:

A. when scheduled by PMS;
B. when determining the pre-overhaul condition of a compressor;
C. when determining the post-overhaul condition of a compressor and;
D. anytime it is suspected that compressor performance is not satisfactory.

EQUIPMENT

Air Flask of known volume
Minimum working pressure shall be no less than maximum compressor output pressure.
Stopwatch

PROCEDURE

1. Enter the Command/unit in Block 1 and the REC number (if applicable) in Block 2 of the test form.

2. Record the System that the compressor belongs to and the Compressor Identification Number in blocks 3 and 4.

3. Obtain information on compressor rating and the minimum acceptable efficiency (i.e., 75%, 80%) from the Maintenance Requirement Card (MRC) or the compressor's Manufacturer Technical Manual. Record the date, the compressor's rating, minimum acceptable efficiency, and the flask water floodable volume (V) in block 5.

4. Verify that pressure gages are calibrated and record calibration date in block 6.

5. Enter gage range in block 7.

WARNING

WHEN WORKING WITH HIGH PRESSURE SYSTEM ALWAYS WEAR FACESHIELD AND HEARING PROTECTION. CLEAR IMMEDIATE AREA OF PERSONNEL.

6. Slowly open test flask drain valve and bleed all air. Close the test flask drain valve and record the initial pressure (P_1) . Note: This value should be 0 psig, however; if a small amount of air remains in the flask, be sure to record the true initial pressure.

7. Start compressor.

8. Start the stopwatch when the back pressure regulator (required on HP compressors only) opens and air begins to fill the test flask. Record the start time in block 8. (MP compressors do not have a BPR)
   Note: The BPR will restrict compressor flow of HP compressor until flask pressure equals BPR setting.

9. Observe the test flask pressure gage. When air pressure reaches maximum flask capacity, stop the compressor and record the total time (T) .

10. Record the final pressure (P_2) in block 9.

11. Calculate the actual compressor output and enter in block 10.

$$COMPRESSOR\ OUTPUT = \frac{V(P_2 P_1)}{P_A T}$$

Where:

P_1 = Initial pressure in test flask (psig)
P_2 = Final pressure in test flask (psig)
P_A = Atmospheric pressure. Use the value of 14.7 psia if at sea level
V = Volume of test flask (cubic feet)
T = Time required to pump up test flask for P_1 to P_2 (minutes)

12. Use the compressor output calculated in step 11 to calculate the compressor efficiency and enter in block 11.

$$EFFICIENCY = \frac{COMPRESSOR\ OUTPUT}{COMPRESSOR\ RATING} \times 100$$

13. If the compressor efficiency is greater than the minimum acceptable efficiency obtained from the manufacturer, the compressor performance is satisfactory. Mark the appropriate box in block 12.

CAUTION

MINIMUM ACCEPTABLE COMPRESSOR EFFICIENCY SHALL BE NO LESS THAN THAT REQUIRED BY SYSTEM PSOB CALCULATIONS.

Note: If compressor efficiency is less than the minimum allowable efficiency, the compressor needs to be inspected for leaks. If no leaks are found during the leak test, the compressor should be taken out of service for further examination or repair.

14. Comment on your findings in block 13.

15. Review and sign the Test Form in Block 14 and obtain a signature from a witness in block 15. If compressor capacity testing is part of a re-entry control, include this completed process instruction and test form in the REC package.

1. COMMAND/UNIT	2. REC NO. REV
3. SYSTEM	4. COMPRESSOR ID
5. TEST CONDITIONS DATE _____ MINIMUM ACCEPTABLE EFFICIENCY = ___%___ COMPRESSOR RATING _____ ft^3/min FLASK VOLUME = V = _____ ft^3	
6. GAGE CALIBRATION DATE _____	7. GAGE RANGE FROM _____ TO _____
8. DURATION OF TEST START TIME _____ STOP TIME _____ TOTAL TIME = T = _____ MINUTES	9. PRESSURE READINGS INITIAL PRESSURE = P_1 = _____ psig FINAL PRESSURE = P_2 = _____ psig
10. COMPRESSOR OUTPUT COMPRESSOR OUTPUT= $\frac{V(P_2-P_1)}{P_A T}$ _____ ft^3/min	11. COMPRESSOR EFFICIENCY EFFICIENCY= $\frac{\text{COMPRESSOR OUTPUT}}{\text{COMPRESSOR RATING}} \times 100 =$ _____ %
12. RESULTS ( ) SATISFACTORY ( ) UNSATISFACTORY	
13. REMARKS	
14. TECHNICIAN SIGN _____ PRINT _____ DATE _____	15. WITNESS SIGN PRINT _____ DATE _____